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Criteria for School Site Selection.
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An outline of the factors and conditions affecting the desirability of a specific building site. The primary factor headings are--(1) availability, (2) location, (3) environment, (4) accessibility, (5) size, (6) shape, (7) topography, (8) acquisition, (9) cost of land, (10) soil condition, (11) sub-surface condition, (12) site preparation, (13) orientation, (14) expansibility, (15) flexibility, (16) educational adaptability, (17) site development, (18) utilities, (19) public service, (20) community use, (21) outdoor activities desired, (22) undesirable, (23) maintenance implications, (24) political implications, and (25) master planning factors. Within these major headings are important secondary related factors. Included in the survey are rating sheets to assist in systematic site evaluation. (MH)

CRITERIA FOR SCHOOL SITE SELECTION

A recent study at Stanford University indicated that both educational program and cost to the district may be seriously affected when inadequate site investigation procedures are employed. An adequate site investigation can be undertaken with appropriate timing only when all the factors affecting school site selection have been properly identified and evaluated. The problem of the study was to identify factors affecting school sites for the purpose of aiding school administrators, Board of Trustees, architects, engineers, planners, and educational facilities specialists in the formulation of a technique for identifying and analyzing and rating the various factors affecting school sites.

The twenty-five factors affecting school sites identified by the study are listed below. All of the factors are important. The relative importance of each is determined by the local conditions in each district and the value judgments of those involved in making decisions regarding site selection.

1. Availability
2. Location
3. Environment
4. Accessibility
5. Size
6. Shape
7. Topography
8. Acquisition
9. Cost of Land
10. Soil Condition
11. Sub-surface Condition
12. Site Preparation
13. Orientation
14. Expansibility
15. Flexibility
16. Educational Adaptability
17. Site Development
18. Utilities
19. Public Service
20. Community Use
21. Outdoor Activities Desired
22. Undesirable
23. Maintenance Implications
24. Political Implications
25. Master Planning Factors to be Considered

Within each of these primary factors, certain secondary factors become apparent. These secondary factors are of equal importance to a complete analysis of a given site. They begin to spell out in greater detail the

task to be undertaken. They provide, in addition, an understanding of the types of data needed in the identification, selection, and acquisition of a school site.

In the succeeding paragraphs, each of the twenty-five primary site selection factors is listed with its related secondary factors. From these, procedures for selecting school sites may be worked out by each district to meet its particular needs.

1. Availability

   a. Identification of unimproved areas of sufficient size in the "pressure" area.
   b. Ascertaining ownership of these areas.
   c. Ascertaining existing and probable future land use, if any, intended for these areas.

2. Location

   a. Natural attendance zones.
   b. Maximum enrollment policy of each attendance unit.
   c. Maximum plant facilities policy of each attendance unit.
   d. Vertical organization of each school.
   e. Community growth or decline pattern.
   f. Land use patterns.
   g. Vacant land susceptible to development.
   h. Natural resources available for educational purposes.
   i. Zoning ordinances.
   j. Subdivision regulations and trends.
   k. Commercial-industrial expansion.
   l. Master plan relationship to other existing and future sites.

3. Environment

   a. View from site and on approach to site.
   b. Obstruction to view.
   c. Obstructions to daylighting orientation.
   d. Proximity to public facilities such as: parks, playgrounds, museums, libraries, various child, youth, and adult centers, health centers, hospitals, auditoriums, etc.
   f. Sources of noise, such as: factories, railroads, street cars, trucks, radio and TV interference, sirens, airports, and test areas involving detonations of high explosives.
   g. Atmospheric conditions such as: smoke, dirt or dust, odors, smog, fog and air pollution. Estimate of control measures being undertaken.

h. Weather and climate such as: prevailing winds, degree days per year, days of sunshine, semi-cloudy weather, average precipitations, snowfall, flood, earthquake, hurricane, tornadoes, etc., active in the area.

4. Accessibility

a. Natural and man-made hazards creating special attendance units.
b. Pupil-travel distances, local conditions prevailing on district policies on maximum distance pupils should walk or ride.
c. Prevailing travel conditions such as: steep grades, no sidewalks, winding narrow streets, business areas, commercial areas, industrial areas, waterways, gullies, grade crossings, freeways, swamps, tidelands, open-pit mining operations, and number of pupils affected.
d. Traffic-flow diagrams and desire-lines for major street and intersections and number of pupils unavoidably crossing same.
e. Coordinated effort of local and school traffic units at peak hours of ingress and egress.
f. Public Transit Service available.
g. General safety of vehicular and pedestrian ingress and egress at the site.
h. Transportation services provided by school. Routes and number of children involved.

5. Size (Excerpt from California Administrative Code -- Section 2001C)*

a. Recommended minimum area.

(1) Elementary -- Five usable acres plus an additional acre for each 100 pupils of predicted ultimate maximum enrollment.
(2) Junior High School -- 15 usable acres plus an additional acre for each 100 pupils of predicted ultimate maximum enrollment.
(3) High School -- 30 usable acres plus an additional acre for each 100 pupils of predicted ultimate maximum enrollment.
(4) Junior College -- 100 usable acres

b. Play area.
c. Adequacy for parking.

*Size criteria were not included as part of the study. These recommendations are taken from the California Administrative Code, Title 5. Education, Chapter 1, Subchapter 8. School Housing, California State Department of Education, Sacramento, California, December 1954, pp. 2-3.

d. Seclusion of classrooms from streets.
e. Future building enlargement and effect on play space.
f. Possibility of future enlargement of site.

6. Shape

a. Determined by educational program, topographical features, and severance damage to landowners.
b. Generally rectangular with 3 to 5 width to length ratio being acceptable but not mandatory.

7. Topography

a. Contour maps available.
b. Drainage area -- surface and sub-surface.
c. Large open areas for play use.
d. Flood plains.
e. Earthquake rift zones.
f. Seasonal effects.
g. Tests.
h. Evaluate fill areas.
i. Consideration of uneven rock ledges or outcroppings.
j. Placement of catch-basins.
k. Exploit sloping sites for best advantages.
l. Cost of site preparation.
m. Cost of site development.
n. Cost of maintenance.

8. Acquisition

a. Availability of land.
b. Number of owners involved.
c. Examine deeds for restrictions and reversionary clauses.
d. Consider severance damages for existing improvements on land.
e. Methods.

9. Cost

a. Weight of initial cost against ultimate cost.
b. Market value.
c. Appraised value.

10. Soil Conditions

a. Growing potential.
b. Bearing capacity.
c. Stability.
d. Types of fill existing.
e. Methods of fill anticipated.
f. Recent test in area.

11. Sub-surface Conditions

a. Percolation.
b. Water Table.
c. Slide characteristics.
d. Commercial mining activity under area.
e. Recent soil tests in area evaluated.

12. Site Preparation

a. Earth to be removed.
b. Fill needed.
c. Grading needed for drives, parking, play areas, etc.
d. Cost of preparation versus acquisition cost.

13. Orientation

a. General climatic conditions.
b. Solar angles and azimuths during school hours.
c. Direction of prevailing winds for natural ventilation.
d. Top-lighting versus side-lighting.
e. Noise and air pollution
f. Controlled environment considerations (may negate concerns for 13 a-e).

14. Expansibility

a. Available land on or adjacent to site.
b. Additional site preparation needed.
c. Estimate of potential need for expansion.

15. Flexibility

a. Ease with which site and facilities could be converted to changing educational, recreational and community needs of the district.

16. Educational Adaptability

a. Estimate of natural features that could enhance educational program by enrichment of certain curriculum offerings such as the natural and physical sciences.
b. Ease with which site and facilities could be converted to use by a different grade grouping organization if reorganization within district demands it.

17. Site Development

a. Cost of landscaping and beautification.
b. Location of buildings on site.
c. Trends in orientation of buildings.
d. Room for expansion on site.

e. Relationship of buildings to each other and to the site in terms of walks, drives, parking, service, utilities, and drainage facilities needed.

18. Utilities

a. Availability of needed water, electricity, fuel, sewage disposal, and storm sewer services.
b. Rights of way and easement restrictions.
c. Topographic barriers to outfalls or sources of supply.
d. Cost of service connections.
e. Availability of appropriate sizes of lines needed by school.

19. Public Services

a. Fire protection.
b. Refuse and garbage disposal.
c. Police protection.
d. Park and recreational facilities.
e. Supplies and equipment delivery.

20. Community Use

a. Estimate of community uses by location of site.
b. Neighborhood of community centers.
c. Potential joint-use of facilities.

21. Outdoor Activities Desired

a. Estimate of such needs are: instructional area, athletic areas, recreational areas, and spectator game area.
b. Affect of needs on site area needs.

22. Undesirable Elements Identified

a. Identification of deleterious moral influences, nuisances, encumbrances, and other social hazards such as: taverns, liquor bars, "gin mills," "skid rows," "honky tonks," etc., in the area.
b. Bulk storage of inflammable or noxious industrial materials creating hazards near site.

23. Maintenance Implications

a. Estimate of potential difficulties to be encountered due to topography, soil conditions, gardening, etc.

24. Political Implications

a. Estimate of probable individuals, group or general public reactions to selection of a particular site and resultant forces affecting school's position in choices available.

25. Master Planning Factors to be Considered

a. Is the interrelationship of schools, existing and proposed, to all community life and functions considered?
b. Is the site a part of a coordinated plan acceptable to best interests of school and community alike?
c. Is an active continuing study of long-range estimate of site needs in progress?

RATING SHEETS

The site rating sheets described in this section are a further extension of ideas stimulated by the study on site selection. They are not intended as refined evaluative instruments. The technical degree to which they are used will depend upon the degree of training and experience of the user. Members of school boards may find them useful as means of orienting themselves to the many facets of school site selection. Architects, engineers, and school planning specialists may wish to use them in specific instances as another data-gathering device for evaluation of school sites. It should be understood that the employment of any rating sheet is of relative merit only, and is but part of a total process.

The rating sheets include both subjective and objective factors. Subjective factors relate to educational considerations and objective factors relate primarily to estimated costs in the Schneider method. Since subjective judgments enter into the evaluation of a given site, two or more persons evaluating a particular site may come up with different ratings. Rating sheets probably find their greatest value as guides for an orderly

analysis of sites, and as a means for making rough comparisons of one site with another. A profile is drawn to signal critical factors.

The task of appraising school sites should be planned in the light of local and community needs. Careful planning, which defines policies and procedures, should include preliminary steps and criteria. Each parcel of land identified as a potential site for a particular school should be subjected to the following line of questioning:

Is it near a present or center of student population?

Is it large enough and of a desirable shape?

Will it be difficult to acquire?

What is the approximate purchase cost?

Can the student get to the site by easy access? If not, what is being planned to make it more accessible?

Is the general environment conducive to an optimum learning situation?

Is there a quiet, restful atmosphere with a vista which is pleasing to the casual eye of one concentrating on an important task? Or, are the surroundings disruptive to the education process?

Is the perimeter protected by a "green belt" which has little chance of being changed to a highly developed fringe?

What about existing natural beauty characteristics? Are there sufficient trees which lend to the site without detracting from its development and utilization? If not, will the soil support ultimate growth of mature trees, shrubbery, and other vegetation, either functionally or in purely decorative ways?

Is the topography of suitable character to enhance or inhibit consideration of a total site utilization plan? Does the ground drain well naturally? Can natural terrain features be exploited to enhance drainage?

How close is the site to established public utilities, present or proposed? How far would service lines need to be run to the best building location on a particular site? Is an adequate sewer located nearby? Is power available?

Are public services, such as policy and fire protection, readily available? Can regular supplies and goods be easily delivered as needed from local distribution points?

Will the proposed major streets and/or highways integrate or isolate the site?

Are weather conditions favorable to the site area?

Figure 1 presents a profile of a numerical evaluation of two sites using twenty site characteristics as the bases for evaluation. This rating sheet affords an opportunity to quickly identify the most critical factors regarding each site. If a characteristic falls below the critical zone, a more thorough examination would be in order to determine its full impact on the total site development. Occasionally, a low rating focuses attention on a factor which may eliminate a site from further consideration by, in effect, negating all other factors.

The site rating sheet shown in Figure 2 is a variation of the profile sheet shown in Figure 1. This method permits the user to formulate a composite rating. Each factor is scored on a ten-point scale. Important sites may be scored on the basis of only 17 or 18 items. In any event, the local options should be shown on the rating sheet.

As each item is comparatively scored (though not necessarily on all items), a dot is placed on the shaded spot opposite the rating assigned to it and below its corresponding item. When all items are scored, a line is drawn connecting each of the dots, thus, forming a graph or profile.

The scores opposite each of the weightings are tallied, multipled by their value and totaled at the extreme right edge of the rating sheet. The total scores are then added and entered at (a) Total Score. The number of items rated is entered at (b) Factors Rated. This fraction, (a)/(b), is

converted into a decimal carried out to three places, and then multiplied by 1000 to remove the decimal. This calculation yields the Site Index or Final Rating based on a 1000 point scale. This figure is then entered for comparison with the scores of all sites rated.

Figure 1
SITE SELECTION PROFILE SHEET

Characteristics	Drainage	Gas	Preparation	Power	Size	Sewer	Water	Site Purchase Cost	Est. Total Cost	Accessibility	Acquisition	Availability	Environment	Hazards	Land Use	Population Center	Services & Supplies	Topography	Utilization	Zoning	Remarks
	OBJECTIVE									SUBJECTIVE											
10	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	
9	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	
8	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	
7	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	
6	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	
5	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	
4	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	
3	o	o	o	C	R	I	T	I	C	A	L	o	Z	o	N	E	o	o	o	o	
2	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	
1	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	
Points / Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Date: 3/23/61
Site Designation: (A)	Site Location Bear Creek Road									District: AUHS District											By: RS/JD

Figure 2

SITE CHARACTERISTIC ANALYSIS AND RATING SHEET

Characteristics	1 Population Center	2 Availability	3 Accessibility	4 Environment	5 Size	6 Acquisition	7 Topography	8 Est. Costs	9 Preparation	10 Utilization	11 Water	12 Sewer	13 Gas	14 Power	15 Service & Supplies	16 Drainage	17 Hazards	18 Climate	19 Land Use	20 Zoning	Total Rating
Rating																					
10	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	50
9	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	27
8	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	32
7	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	42
6	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	12
5	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
4	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
3	O	O	O	O	C	R	I	T	I	C	A	L - Z	O	N	E	O	O	O	O		
2	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
1	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
0	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	

Site Designation: (B) Site Index Calculation: $\frac{A}{B}$ x 1000 Site Index: (815) A Total Score / B Factor Rated x 10 = 163 / 200

Site Location: 13th & Willow E. District: OHara Date: 10-58 Rated by: R.C.Schneider